

GRAY'S ANATOMY

# Anatomy of the Human Body

by Henry Gray, F.R.S.

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*Twenty-Ninth American Edition, edited by*

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Former Editor of the Anatomical Record*

*With new drawings by Don M. Alvarado,  
Professor of Medical Illustration*

*1178 Illustrations, mostly in Color*



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# Anatomy of the Human Body



*View of the Dissecting Room  
of St. George's Hospital. Taken 27 March 1860*

*To Henry Gray, Esq. F.R.S.  
as a respectful remembrance from  
Joseph Lushington.*

Henry Gray appears in the foreground, third from the left.  
(Reproduced by permission of the Governors of St. George's Hospital.)

to

**Henry Gray and H. Van Dyke Carter**

in admiration of their imagination and skill in  
originating this book

and to

**The Many Students and Teachers**

**Who Have Used It**

this one hundred and fourteenth year edition is dedicated  
with deep appreciation

## *Henry Gray, F.R.S., F.R.C.S.*

THE ORIGINATOR of this now famous book, which has reached its one hundred and fourteenth year of continuous publication in America, was born in Windsor, England, in 1825. A letter written to Lea & Febiger, by Henry Gray's great nephew, F. Lawrence Gray, has supplied this date as well as some interesting biographical information.

Henry's father, William Gray, was born in 1787. He is reported to have been an only child. Whether for protection or from special interest he was placed in the royal household where he was brought up. In 1811, before the Regency, and while he was in his twenties, he was Deputy Treasurer to the Household of the Prince of Wales. On the accession of George IV as Regent in 1820, William Gray became the King's private messenger and continued in this capacity, with William IV, until his death at the age of forty-seven. He married Ann Walker in 1817 and during George IV's reign lived at Windsor Castle in accommodations provided for him and his wife. When William IV acceded to the throne in 1830, the Grays moved to London in order to be near Buckingham Palace, and either immediately or soon after that No. 8 Wilton Street became the family residence.

Henry Gray had two brothers and one sister. His younger brother, Robert, trained to become a naval surgeon. He died at sea in his twenty-second year. Henry's sister, younger than he, apparently never was married. His older brother, Thomas William, adopted the legal profession, and was Attorney to the Queen's Bench in 1841, and, in 1846, Solicitor of the High Court of Chancery. He had a large family—seven sons and three daughters. His third son, Charles, the nephew whom Henry treated for smallpox in 1861, lived to the ripe age of fifty-three. His fifth son, Frederick, moved to South Africa, married in 1881

and had six children, one of whom was the F. Lawrence Gray mentioned above.

After his father's death in 1834, Henry Gray continued living at 8 Wilton Street with his mother, brothers and sister. This is undoubtedly the address from which he later carried on his short practice and the place where he wrote his famous book. He and his brothers were educated at one of the large London schools, possibly Westminster, Charterhouse, or St. Paul's. He was engaged to be married at the time of his death.

Henry Gray's signature appears on the pupil's book at St. George's Hospital, London, as a "perpetual student" entering on the 6th of May, 1845. Four years later, in 1849, his name appears in the Proceedings of the Royal Society with the M.R.C.S. after it, the approximate equivalent of our M.D. While still a student in 1848, he won the triennial prize of the Royal College of Surgeons for an essay entitled "The Origin, Connections and Distribution of the Nerves to the Human Eye and Its Appendages, Illustrated by Comparative Dissections of the Eye in Other Vertebrate Animals." He was appointed for the customary year as house surgeon to St. George's Hospital in 1850. Successively thereafter he held the posts of demonstrator of anatomy, curator of the museum, and lecturer on anatomy at St. George's Hospital. In 1861 he was surgeon to St. James Infirmary and was a candidate for the post of assistant surgeon to St. George's Hospital and would certainly have been elected had he not died from confluent smallpox which he contracted from his nephew, Charles, whom he was treating. He was buried at Highgate Cemetery in June 1861. Sir Benjamin Brodie, president of the Royal Society, wrote, "I am much grieved about poor Gray. His death, just as he was on the point of obtaining the reward of his labors, is a sad event indeed

... Gray is a great loss to the hospital and school. Who is there to take his place?"

During his lifetime Henry Gray received outstanding recognition for his original investigations. That they have received so little mention since his death is as surprising as the lack of information about his life. The study of the eye which won him the Royal College of Surgeons prize was expanded into an embryological work, "On the development of the retina and optic nerve, and of the membranous labyrinth and auditory nerve," published in the Philosophical Transactions of the Royal Society in 1850. It contains the earliest description of the histogenesis of the retina. Two years later the Transactions contained another article, "On the development of the ductless glands in the chick." This must have stimulated Gray's interest in the spleen, which he classed as a ductless gland, because he obtained an allotment of funds for further study from the annual grant placed at the disposal of the Royal Society by Parliament for the promotion of science. The result was a monograph of 380 pages, "On the Structure and Use of the Spleen," which won him the triennial Astley Cooper Prize of £300 (about \$1,500.00) in 1853. It was published by J. W. Parker and Son in 1854, but appears now to be excessively rare. Numerous "first observations" recorded in this book have escaped notice by all subsequent authors writing about the spleen. Gray described, among other things, the origin of the spleen from the dorsal mesogastrium ten years before Müller who is usually given credit for the discovery.

As a result of his ability and accomplishment, Henry Gray was made a Fellow of the Royal Society at the very young age of twenty-five. Besides anatomy, his interests also included pathological and clinical investigation. In 1853 he had a paper in the Medico-Chirurgical Proceedings entitled, "An Account of a Dissection of an Ovarian Cyst Which Contained Brain," and in 1856 a more extensive treatise entitled, "On Myeloid and Myelo-Cystic Tumours of Bone; Their Structure, Pathology, and Mode of Diagnosis."

His crowning achievement, however, and the one which is the source of his lasting fame is the publication, *Anatomy, Descrip-*

*tive and Surgical*, now widely known as *Gray's Anatomy*.

## 114 YEARS OF GRAY'S ANATOMY

The first edition of *Gray's Anatomy* was published in London by J. W. Parker and Son in 1858 and in June of the following year in Philadelphia by Blanchard and Lea who had purchased the American rights for the book. The American edition was identical with the English, except that many typographical errors had been corrected, the index considerably improved, and the binding made more rugged. It contained xxxii + 754 pages and 363 figures. The drawings were the work of Dr. H. Van Dyke Carter of whom Gray writes in his preface, "The Author gratefully acknowledges the great services he has derived, in the execution of this work, from the assistance of his friend, Dr. H. V. Carter, late Demonstrator of Anatomy at St. George's Hospital. All the drawings, from which the engravings were made, were executed by him. In the majority of cases, they have been copied from, or corrected by, recent dissections, made jointly by the Author and Dr. Carter."

Blanchard and Lea obtained the services of Dr. R. J. Dunglison to edit the first and the next four American editions. Dunglison corrected the typographical and other small errors and improved the index but made very few alterations or additions in the text. Almost no adaptation was required because medical education in this country and in England were still much alike.

Henry Gray had just finished preparing the second edition before his untimely death. This was published in 1860 in England and in 1862 in this country under the editorship of Dunglison. The next edition published in America was a "New American from the 5th English Edition." This appeared in 1870 and was bound in either cloth or sheep. Another pause, and there appeared the "New American from the 8th English" in 1878, and "The New American from the 10th English" in 1883. Dunglison was again the editor, but a new editor, W. W. Keen, revised extensively the section on topographical anatomy at the end of the book. The following edition, a



"New American from the Eleventh English," published in 1887, was edited and thoroughly revised by W. W. Keen. Color was used for the first time in the chapters on blood vessels and nerves. The "New American from the Thirteenth English" appeared in 1893, apparently edited by Keen and others.

In 1896 the reference to the English edition was dropped and we have the fourteenth edition with the editors Bern B. Gallaudet, F. J. Brockway, and J. P. McMurrich. J. C. DaCosta, editor of the sixteenth edition in 1905, expanded the book, introducing much new material. E. A. Spitzka assisted DaCosta with the seventeenth edition in 1908 and edited the next two alone in 1910 and 1913. The publishers also tried a "New American from the Eighteenth English Edition" in 1913, but its sale was much smaller than that of the American edition of that year. In 1918, W. H. Lewis began his editorship, giving the book a scholarly treatment, reducing its length, improving the sections on Embryology, and generally giving a more straightforward treatment of the various chapters. For his last edition, the twenty-fourth, pub-

lished in 1942, he had the assistance of six associate editors.

Beginning with the twentieth edition in 1918, new editions appeared at regular intervals of six years; their dates and the names of the editors are listed on page x. The interval was changed to five years for the twenty-seventh edition, published in 1959, in order to have its publication fall on the 100th year.

During the last sixty-seven years the American and English editions have tended to drift apart. Even from an early date, new American editions were less frequent than the English, and if the American editions had been numbered independently from the beginning the present edition would be the twenty-fourth, whereas the current English edition is the thirty-fifth. Somewhat more of the imprint of Henry Gray has been preserved in the American edition, in the illustrations especially, as it still has over 200 drawings based on the original illustrations by Carter but only some twenty-five have been retained in the latest English edition. Nevertheless, both books are *Gray's Anatomy*, both have the unmistakable stamp of their originator, and both uphold his fine tradition.

## AMERICAN EDITIONS OF GRAY'S ANATOMY

<i>Date</i>	<i>Edition</i>	<i>Editor</i>
June 1859	First American Edition	Dr. R. J. Dunglison
February 1862	Second American Edition	Dr. R. J. Dunglison
May 1870	New Third American from Fifth English Edition	Dr. R. J. Dunglison
July 1878	New American from the Eighth English Edition	Dr. R. J. Dunglison
August 1883	New American from the Tenth English Edition	Dr. R. J. Dunglison
September 1887	New American from the Eleventh English Edition	Dr. W. W. Keen
September 1893	New American from the Thirteenth English Edition	Dr. W. W. Keen
September 1896	Fourteenth Edition	Drs. Gallaudet, Brockway and McMurrich
October 1901	Fifteenth Edition	Drs. Gallaudet, Brockway and McMurrich
October 1905	Sixteenth Edition	Dr. J. C. DaCosta
September 1908	Seventeenth Edition	Drs. DaCosta and Spitzka
October 1910	Eighteenth Edition	Dr. E. A. Spitzka
July 1913	Nineteenth Edition	Dr. E. A. Spitzka
October 1913	New American from Eighteenth English Edition	Dr. R. Howden
September 1918	Twentieth Edition	Dr. W. H. Lewis
August 1924	Twenty-first Edition	Dr. W. H. Lewis
August 1930	Twenty-second Edition	Dr. W. H. Lewis
July 1936	Twenty-third Edition	Dr. W. H. Lewis
May 1942	Twenty-fourth Edition	Dr. W. H. Lewis
August 1948	Twenty-fifth Edition	Dr. C. M. Goss
July 1954	Twenty-sixth Edition	Dr. C. M. Goss
August 1959	Twenty-seventh Edition	Dr. C. M. Goss
August 1966	Twenty-eighth Edition	Dr. C. M. Goss
January 1973	Twenty-ninth Edition	Dr. C. M. Goss

## Preface

When Henry Gray undertook the writing of his new Anatomy book for students and practitioners of medicine he was fortunate in having a fellow anatomist with skill and originality to make his illustrations. These drawings from original dissections by Van Dyke Carter, with their diagrammatic clarity, have left an imprint almost as characteristic as the author's design for the text.

In keeping with the constant purpose of preserving the familiar atmosphere of Gray's Anatomy while bringing it up to date I have been desirous of continuing Carter's style in the illustrations. During the last two or three editions, however, a number of borrowed illustrations have been used to supplement the original figures. These have been colored halftones, for the most part, and although they have served their purpose admirably they have left something to be desired in clarity and register. In this edition I have again had the collaboration of Don Alvarado, Professor of Medical Illustration at Louisiana State University in replacing these illustrations. His pen has captured much of the style of the engravings on wood by Carter.

The trend in medical education toward earlier and earlier introduction of clinical subjects into the curriculum continues to place a burden on both faculty and students in the basic sciences by reducing the number of hours allotted to them. Each teacher of Anatomy will doubtless provide his class with his own outline, therefore, but the students must have a more complete, detailed, and accurate source of information as a supplement. This edition is well adapted for this purpose by its logical arrangement and clear illustrations. It is not commonly realized that the book may be used as an atlas as well as a text. Almost every structure in the body is illustrated somewhere in the book. In order to avoid increasing the size of the book, however,

illustrations are seldom repeated. Many references between chapters are given in the text and as a student becomes familiar with the book, he may supplement these with his own index of illustrations. The new drawings in the chapter on the Peripheral Nerves especially may be used as if they were plates in a regional atlas for the visualization of blood vessels and other structures as well as nerves. Also in this edition the number of x-ray pictures has been somewhat increased and they are appropriately placed throughout the book instead of being included in a single chapter.

The nomenclature in this edition again follows the *Nomina Anatomica* adopted by the International Anatomical Nomenclature Committee and the International Congress of Anatomists. Following the recommendation of the I.A.N.C., however, the English equivalent of the Latin term is frequently used. A fundamental change in the terms of position and direction in the N.A. is inevitable because the newly adopted *Nomina Embryologica* and *Nomina Histologica* have been required to use such terms as dorsal and ventral or cranial and caudal in place of anterior and posterior or superior and inferior. These newer terms are occasionally used in appropriate places in anticipation of these changes. The older names still in common use by the teachers in clinical departments are included in parentheses for the benefit of students reviewing Anatomy for later examinations.

Grateful acknowledgement is made to Professor Frank Allan and an artist of his Visual Aids Department, Robert Edwards, for histological drawings. Acknowledgement is also made to Professor Don Fawcett for an illustration of the spermatozoon and to Professor Barry Anson for drawings of the liver from his new edition of *Morris' Human Anatomy*.

Gratitude is expressed to my colleagues

in the Department of Anatomy at George Washington University, Professors Ira Telford, Paul Calabrisi, John Christensen, Tom Johnson, Ernest Albert, and Marilyn Koering as well as to the students for their help and encouragement. Thanks are extended

to the publishers for the loyal confidence, patience, and encouragement they have shown.

CHARLES MAYO GOSS

*Bethesda, Maryland*

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